

## SEQUENCE LISTING



<110> Vaisvila, Romualdus  
 Morgan, Richard D.  
 Kucera, Rebecca B.  
 Claus, Toby B.  
 Raleigh, Elisabeth A.

<120> Method For Cloning And Producing The MseI Restriction Endonuclease

<130> NEB-181

<140> US 09/689,343  
 <141> 2000-10-12

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<170> PatentIn version 3.1

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Arg Met Ile Tyr Ile Asp Pro Pro Phe Asn Thr Gly Arg Thr Gln Arg	
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Leu Gln Ser Leu Lys Thr Arg Ser Val Thr Gly Ser Arg Val Gly	
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ttc aaa ggc cag acg tac gac acg gtc aag agc act ctg cac tcg tat	240
Phe Lys Gly Gln Thr Tyr Asp Thr Val Lys Ser Thr Leu His Ser Tyr	
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85 90 95	
gag gct tgg ccg ttg ctc acc cct gac ggc gcg ctc tat ctt cat ctg	336
Glu Ala Trp Arg Leu Leu Thr Pro Asp Gly Ala Leu Tyr Leu His Leu	
100 105 110	
gat tac ccg gag gtt cac tac gcc aag gtc gtc ctc gac gcg atg ttc	384
Asp Tyr Arg Glu Val His Tyr Ala Lys Val Val Leu Asp Ala Met Phe	
115 120 125	
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Tyr Val Lys Asp Pro Asn Asn Tyr Val Trp Asn Gly Gln Asp Val Asp  
165 170 175

cgc gag ccc tac atg gcg ccc ggg ctc gtt aca ccc gag aag gta gcg 576  
Arg Glu Pro Tyr Met Ala Pro Gly Leu Val Thr Pro Glu Lys Val Ala  
180 185 190

ctt ggc aag ctg ccc acc gac gtc tgg tgg cac aca atc gtt ccg cct 624  
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Ile Arg Arg Met Ile Gln Ala Ser Ser Asn Glu Gly Asp Trp Val Leu  
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245 250 255

gga cgc cgt ttt gtg ctc gta gac gtc aac cca gaa gca atc gcg gta 816  
Gly Arg Arg Phe Val Leu Val Asp Val Asn Pro Glu Ala Ile Ala Val  
260 265 270

atg gca aaa cgg ttg gat gac ggg gca ttg gac acc agc gtg acg atc 864  
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Arg Met Ile Tyr Ile Asp Pro Pro Phe Asn Thr Gly Arg Thr Gln Arg  
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Phe Lys Gly Gln Thr Tyr Asp Thr Val Lys Ser Thr Leu His Ser Tyr

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Pro Asn Arg Leu Ile Trp Ala Asp Asn Leu Pro Leu Met Val Asp Leu	
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ttg gcc gaa tat gaa ggg aaa atc gat ctg atc tac gcc gat ccc cct	192
Leu Ala Glu Tyr Glu Gly Lys Ile Asp Leu Ile Tyr Ala Asp Pro Pro	
50 55 60	
ttt ttt acg gat cgt act tat gcg gcg cga att ggt cat ggg gag gat	240
Phe Phe Thr Asp Arg Thr Tyr Ala Ala Arg Ile Gly His Gly Glu Asp	
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tcg cgt cgt cca caa acc tgg cag ctt gca gaa gga tat acg gac gag	288
Ser Arg Arg Pro Gln Thr Trp Gln Leu Ala Glu Gly Tyr Thr Asp Glu	
85 90 95	
tgg aag gat tta gat gaa tac ctg gac ttc ctt tat cca cgc ctg gta	336
Trp Lys Asp Leu Asp Glu Tyr Leu Asp Phe Leu Tyr Pro Arg Leu Val	
100 105 110	
ctg atg tat cga ctg ctg gca cca cac gga acg ctc tac ttg cac ctg	384
Leu Met Tyr Arg Leu Leu Ala Pro His Gly Thr Leu Tyr Leu His Leu	
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Asp Trp His Ala Asn Ala Tyr Val Arg Val Leu Leu Asp Glu Ile Phe	
130 135 140	
ggg cga cag cgg ttt ctc aac gag atc gtc tgg atc tat cac ggc ccc	480
Gly Arg Gln Arg Phe Leu Asn Glu Ile Val Trp Ile Tyr His Gly Pro	
145 150 155 160	
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Ser Ala Ile Arg Arg Ala Phe Lys Arg Lys His Asp Thr Ile Leu Val	
165 170 175	
tat gtg aaa ggt gaa aac tat aca ttc aat gcg gat gcg gtt cgt caa	576
Tyr Val Lys Gly Glu Asn Tyr Thr Phe Asn Ala Asp Ala Val Arg Gln	
180 185 190	
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Gly	Phe	Gly	Lys	Val	Pro	Asp	Leu	Gln	Arg	Gly	Lys	Val	Pro	Glu	Asp	
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Trp	Trp	Tyr	Phe	Pro	Val	Val	Ala	Arg	Leu	His	Arg	Glu	Arg	Ser	Gly	
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Tyr	Pro	Thr	Gln	Lys	Pro	Gln	Ala	Leu	Leu	Glu	Arg	Ile	Leu	Leu	Ala	
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Ser	Ser	Asn	Ala	Gly	Asp	Leu	Val	Ala	Asp	Phe	Phe	Cys	Gly	Ser	Gly	
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Ile	Gln	Pro	Leu	Pro	Pro	Asp	Trp	Leu	Ile	Ile	Ala	Glu	Glu	Gln	Ile	
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cgc	ctc	caa	gca	ccc	ttt	ctc	gta	gat	ttt	tgg	gaa	gtg	gac	gat	caa	1056
Arg	Leu	Gln	Ala	Pro	Phe	Leu	Val	Asp	Phe	Trp	Glu	Val	Asp	Asp	Gln	
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tgg	gat	ggc	aaa	atc	ttc	cgc	agc	cgt	cat	caa	ggc	tta	cgc	tcc	cgc	1104
Trp	Asp	Gly	Lys	Ile	Phe	Arg	Ser	Arg	His	Gln	Gly	Leu	Arg	Ser	Arg	
		355					360					365				
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Leu	Gln	Glu	Gln	Ala	Pro	Leu	Ser	Leu	Pro	Leu	Thr	Gly	Asn	Gly	Leu	
	370					375					380					
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Leu	Cys	Val	Arg	Val	Val	Ser	Arg	Glu	Gly	Glu	Tyr	Tyr	Glu	Phe	Thr	
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ggt	cga	gcc	gat	agc	cct	cac	ccc	gta	tcg	ttt	tga					1236
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35 40 45

Leu Ala Glu Tyr Glu Gly Lys Ile Asp Leu Ile Tyr Ala Asp Pro Pro  
50 55 60

Phe Phe Thr Asp Arg Thr Tyr Ala Ala Arg Ile Gly His Gly Glu Asp  
65 70 75 80

Ser Arg Arg Pro Gln Thr Trp Gln Leu Ala Glu Gly Tyr Thr Asp Glu  
85 90 95

Trp Lys Asp Leu Asp Glu Tyr Leu Asp Phe Leu Tyr Pro Arg Leu Val  
100 105 110

Leu Met Tyr Arg Leu Leu Ala Pro His Gly Thr Leu Tyr Leu His Leu  
115 120 125

Asp Trp His Ala Asn Ala Tyr Val Arg Val Leu Leu Asp Glu Ile Phe  
130 135 140

Gly Arg Gln Arg Phe Leu Asn Glu Ile Val Trp Ile Tyr His Gly Pro  
145 150 155 160

Ser Ala Ile Arg Arg Ala Phe Lys Arg Lys His Asp Thr Ile Leu Val  
165 170 175

Tyr Val Lys Gly Glu Asn Tyr Thr Phe Asn Ala Asp Ala Val Arg Gln  
180 185 190

Pro Tyr His Pro Ser Xaa His Lys Thr Phe Ala Ser Ser Pro Lys Ala  
195 200 205

Gly Phe Gly Lys Val Pro Asp Leu Gln Arg Gly Lys Val Pro Glu Asp  
210 215 220

Trp Trp Tyr Phe Pro Val Val Ala Arg Leu His Arg Glu Arg Ser Gly  
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Tyr Pro Thr Gln Lys Pro Gln Ala Leu Leu Glu Arg Ile Leu Leu Ala

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250

255

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Asp Ala Ser Trp Arg Ala Val His Val Thr Arg Thr Arg Leu Leu Arg  
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Glu Gly Val Ser Phe Thr Phe Glu Arg Gln Glu Thr Phe Thr Leu Pro  
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Ile Gln Pro Leu Pro Pro Asp Trp Leu Ile Ile Ala Glu Glu Gln Ile  
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Arg Leu Gln Ala Pro Phe Leu Val Asp Phe Trp Glu Val Asp Asp Gln  
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Trp Asp Gly Lys Ile Phe Arg Ser Arg His Gln Gly Leu Arg Ser Arg  
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Leu Gln Glu Gln Ala Pro Leu Ser Leu Pro Leu Thr Gly Asn Gly Leu  
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ctg atc tac atc gat cct ccg ttc aac acc gga aag gtt cag gag cgc 144  
Leu Ile Tyr Ile Asp Pro Pro Phe Asn Thr Gly Lys Val Gln Glu Arg  
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act cag ctc aaa acg gtg cgc tcc gag tgg ggc gat cgc gtc gga ttc	192
Thr Gln Leu Lys Thr Val Arg Ser Glu Trp Gly Asp Arg Val Gly Phe	
50 55 60	
cag ggc cgt cgc tac gaa agc atc gtc gtg ggt aag aag cgc ttt acc	240
Gln Gly Arg Arg Tyr Glu Ser Ile Val Val Gly Lys Lys Arg Phe Thr	
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gac ttc ttc gac gac tat ctg gct ttc ctg gaa ccg cgc ctg gtc gaa	288
Asp Phe Phe Asp Asp Tyr Leu Ala Phe Leu Glu Pro Arg Leu Val Glu	
85 90 95	
gcc cat cgt gtt ctg gcg ccg cac ggg tgc ctc tac ttt cac gtc gac	336
Ala His Arg Val Leu Ala Pro His Gly Cys Leu Tyr Phe His Val Asp	
100 105 110	
tac cgc gag gtg cac tac tgt aag gtc ctt ctt gac ggc atc ttc ggt	384
Tyr Arg Glu Val His Tyr Cys Lys Val Leu Leu Asp Gly Ile Phe Gly	
115 120 125	
cgc gag gcc ttt ctc aac gag atc atc tgg gcc tac gat tac ggc ggg	432
Arg Glu Ala Phe Leu Asn Glu Ile Ile Trp Ala Tyr Asp Tyr Gly Gly	
130 135 140	
cgt ccg aag gac agg tgg cct cct aag cac gac aac atc ctg ctc tac	480
Arg Pro Lys Asp Arg Trp Pro Lys His Asp Asn Ile Leu Leu Tyr	
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Ala Lys Thr Pro Gly Arg His Val Phe Asn Ala Asp Glu Ile Glu Arg	
165 170 175	
att ccc tac atg gct ccg ggc ctg gtt ggc ccc gaa aag gca gcc cgt	576
Ile Pro Tyr Met Ala Pro Gly Leu Val Gly Pro Glu Lys Ala Ala Arg	
180 185 190	
gga aaa ctg cca acc gac acg tgg tgg cat acg atc gtt ccg acc agc	624
Gly Lys Leu Pro Thr Asp Thr Trp Trp His Thr Ile Val Pro Thr Ser	
195 200 205	
ggc tcc gag aag acc ggg tat cca acc cag aaa cct tta ggg att ctc	672
Gly Ser Glu Lys Thr Gly Tyr Pro Thr Gln Lys Pro Leu Gly Ile Leu	
210 215 220	
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225 230 235 240	
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cgg cgt ttc att ctg gtc gat aac cat ccg gag gcc ctc cag gtg atg	816
Arg Arg Phe Ile Leu Val Asp Asn His Pro Glu Ala Leu Gln Val Met	
260 265 270	
gcc agg cgc ttc gac ggc atc gag ggg atc gaa tgg gtg ggc ttc gat	864
Ala Arg Arg Phe Asp Gly Ile Glu Gly Ile Glu Trp Val Gly Phe Asp	
275 280 285	
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Thr Gln Leu Lys Thr Val Arg Ser Glu Trp Gly Asp Arg Val Gly Phe  
50 55 60

Gln Gly Arg Arg Tyr Glu Ser Ile Val Val Gly Lys Lys Arg Phe Thr  
65 70 75 80

Asp Phe Phe Asp Asp Tyr Leu Ala Phe Leu Glu Pro Arg Leu Val Glu  
85 90 95

Ala His Arg Val Leu Ala Pro His Gly Cys Leu Tyr Phe His Val Asp  
100 105 110

Tyr Arg Glu Val His Tyr Cys Lys Val Leu Leu Asp Gly Ile Phe Gly  
115 120 125

Arg Glu Ala Phe Leu Asn Glu Ile Ile Trp Ala Tyr Asp Tyr Gly Gly  
130 135 140

Arg Pro Lys Asp Arg Trp Pro Pro Lys His Asp Asn Ile Leu Leu Tyr  
145 150 155 160

Ala Lys Thr Pro Gly Arg His Val Phe Asn Ala Asp Glu Ile Glu Arg  
165 170 175

Ile Pro Tyr Met Ala Pro Gly Leu Val Gly Pro Glu Lys Ala Ala Arg  
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Gly Lys Leu Pro Thr Asp Thr Trp Trp His Thr Ile Val Pro Thr Ser  
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Gly Ser Glu Lys Thr Gly Tyr Pro Thr Gln Lys Pro Leu Gly Ile Leu  
210 215 220

Arg Arg Ile Val Gln Ala Ser Ser His Pro Gly Ala Val Val Leu Asp  
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Phe Phe Ala Gly Ser Gly Thr Thr Gly Val Ala Ala Phe Glu Leu Gly  
245 250 255

Arg Arg Phe Ile Leu Val Asp Asn His Pro Glu Ala Leu Gln Val Met  
260 265 270

Ala Arg Arg Phe Asp Gly Ile Glu Gly Ile Glu Trp Val Gly Phe Asp  
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tgg gtc ggc agc ccg ttc gag tgg atc ctt cgc gtt cca tcc aga acg 144  
Trp Val Gly Ser Pro Phe Glu Trp Ile Leu Arg Val Pro Ser Arg Thr  
35 40 45

aag ggc gcg gtc ggt gag ctg ctc gtg agc gaa tgg gct aat gcc aaa 192  
Lys Gly Ala Val Gly Glu Leu Val Ser Glu Trp Ala Asn Ala Lys  
50 55 60

ggc ctc cgt gtg aag agg tcg ggg tcc agc gat gcg gac cgc gtg atc 240  
Gly Leu Arg Val Lys Arg Ser Gly Ser Ser Asp Ala Asp Arg Val Ile  
65 70 75 80

aac ggg cat cgc atc gag atc aag atg tcg act ttg tgg aag tcc gcc 288  
Asn Gly His Arg Ile Glu Ile Lys Met Ser Thr Leu Trp Lys Ser Gly  
85 90 95

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Gly Phe Lys Phe Gln Gln Ile Arg Asp Gln Glu Tyr Asp Phe Cys Leu  
100 105 110

tgc ctt ggg atc agc ccg ttc gaa gtg cac gcg tgg ctg ctg ccc aaa 384

Cys Leu Gly Ile Ser Pro Phe Glu Val His Ala Trp Leu Leu Pro Lys  
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 Asp Leu Leu Leu Glu Tyr Val Ile Gly His Met Gly Gln His Thr Gly  
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 gcg agc ggg agc gac act gcg tgg ctg ggg ttc cca gcg gac gag ccg 480  
 Ala Ser Gly Ser Asp Thr Ala Trp Leu Gly Phe Pro Ala Asp Glu Pro  
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 tat gac tgg atg cgc cct ttc gga ggt cgc tta ggt cac gtc gaa gat 528  
 Tyr Asp Trp Met Arg Pro Phe Gly Gly Arg Leu Gly His Val Glu Asp  
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Lys Gly Ala Val Gly Glu Leu Leu Val Ser Glu Trp Ala Asn Ala Lys  
 50 55 60

Gly Leu Arg Val Lys Arg Ser Gly Ser Ser Asp Ala Asp Arg Val Ile  
 65 70 75 80

Asn Gly His Arg Ile Glu Ile Lys Met Ser Thr Leu Trp Lys Ser Gly  
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Gly Phe Lys Phe Gln Gln Ile Arg Asp Gln Glu Tyr Asp Phe Cys Leu  
 100 105 110

Cys Leu Gly Ile Ser Pro Phe Glu Val His Ala Trp Leu Leu Pro Lys  
 115 120 125

Asp Leu Leu Leu Glu Tyr Val Ile Gly His Met Gly Gln His Thr Gly  
 130 135 140

Ala Ser Gly Ser Asp Thr Ala Trp Leu Gly Phe Pro Ala Asp Glu Pro  
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 ccggtttttt ttgcgttgaa tttgtcattt tgtgccgtgg tgtttaaacc gcacagaata 180  
 aattgtcgtg atttcacctt taaaataaaa ttaaaagaga aaaaaattct ctgtggaagg 240  
 gctatgtag ataaaattga ccgtaagctg ctggccttac tgcagcagga ttgcaccctc 300  
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Bl  
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